Contents

Preface	vii
Interfacial engineering—a perspective	1
Grain boundary design and control for high temperature materials	11
Aggregates of grain boundaries: structure and properties	29
High resolution transmission electron microscopy and atomistic calculations of grain boundaries in metals and intermetallics M. J. Mills (Livermore, CA, USA)	35
Mobility control of ceramic grain boundaries and interfaces	51
Orientation imaging microscopy: application to the measurement of grain boundary structure	59
The role of grain boundaries in high temperature deformation	67
Role of small-angle (subgrain boundary) and large-angle (grain boundary) interfaces on 5- and 3-power-law creep	81
Model for interface reaction control in superplastic deformation of non-stoichiometric ceramics	89
Superplasticity in ceramic and metal matrix composites and the role of grain size, segregation, interfaces, and second phase morphology	97
Positive exponent superplasticity in advanced aluminum alloys with nano or near-nano scale grained structures	109
Superplasticity in grained ceramics and ceramic composites: current understanding and future prospects	119
Precipitation and recrystallization during processing of a superplastic Al-10Mg-0.1Zr alloy	135
Processing nanocrystalline ceramics for applications in superplasticity	145
Hall-Petch strengthening in nanocrystalline metals	161
Processing of nano-grained materials	169
Reinforcements for ceramic–matrix composites for elevated temperature applications	179
Interfacial properties and high-temperature mechanical behavior of fiber-reinforced ceramic composites	185

,	Creep deformation of whisker-reinforced alumina	199
]	High-temperature plasticity effects in bridged cracks and subcritical crack growth in ceramic composites	211
	Mechanics and mechanisms of crack growth at or near ceramic-metal interfaces: interface engineering strategies for promoting toughness	221
I	Future research directions for interface engineering in high temperature plasticity	237
F	AUTHOR INDEX	243
S	SUBJECT INDEX	245

